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ABSTRACT

The study compared the facilitative effects of pre- and post-organizers on the learning of structured anthropology materials in the third and sixth grades. Investigator-prepared student texts were published in three formats: pre-organizers, post-organizers, and no-organizers. Two investigator-constructed norm-referenced Anthropology Achievement Tests were administered at each grade level. A one-way fixed-effects analysis of covariance, with reading as covariate, used the class mean scores of the three treatment groups on Anthropology Achievement Test One and Two at each grade level to determine if the adjusted mean scores differed significantly (p .15) across treatment groups. Computed F ratios were non-significant at both grade levels when class means were used as the unit of statistical analysis with reading as covariate. When class means were used as the unit of statistical analysis, the findings of the main treatment effect were consistent. The data did not produce evidence that pre- or post-organizers facilitate learning of structured anthropology materials at either the third or sixth grade. (Author)

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THE EFFECTS OF THE POSITION OF ORGANIZERS ON THE LEARNING OF STRUCTURED ANTHROPOLOGY MATERIALS IN GRADES THREE AND SIX

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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ABSTRACT

Purpose

The study compared the facilitative effects of pre- and post-organizers on the learning of structured anthropology materials in the third and sixth grades.

Methodology

Investigator-prepared student texts were published in three formats: pre-organizers, post-organizers, and no-organizers. Two investigator-constructed norm-referenced Anthropology Achievement Tests were administered at each grade level.

A one-way fixed-effects analysis of covariance, with reading as covariate, used the class mean scores of the three treatment groups on Anthropology Achievement Tests One and Two at each grade level to determine if the adjusted mean scores differed significantly ($p<.15$) across treatment groups.

Results

Computed F ratios were non-significant at both grade levels when class means were used as the unit of statistical analysis with reading as covariate.

Conclusions

When class means were used as the unit of statistical analysis, the findings of the main treatment effect were consistent. The data did not produce evidence that pre- or post-organizers facilitate learning of structured anthropology materials at either the third or sixth grade.

SUMMARY

The Effects of the Position of Organizers on the Learning of Structured Anthropology Materials in Grades Three and Six

Main Finding

Analysis of covariance using class means as the unit of statistical analysis indicated that there was no significant difference in the achievement of pupils using structured anthropology materials in grades three and six organized in three different ways--pre-organizer, post-organizer, and no-organizer.

Purpose

The purpose of the research was to test the facilitative effects of organizers--one of the components of David P. Ausubel's theory of meaningful, verbal reception learning--on the learning of structured anthropology materials in the primary and intermediate grades. Three treatment groups were used: pre-organizer, the organizers preceded the learning passages; post-organizers, the organizers were placed after the learning passages; and no-organizers.

Methodology

Three related methodologies were used--curriculum construction, test construction, and comparative field trial.

Prior to curriculum construction, the characteristics of organizers were specified. The learning passages were written: Grade Three, The Changing World Today: Case Studies of Modernization in Japan, Kenya, and India; Grade Six, Cultural Change in Mexico and the United States. Organizers were written in accordance with the criteria established by the investigators.

A pilot study was conducted at each grade level to establish test reliability. Test items from the pilot mid-term were used to improve reliability of the final test, Anthropology Achievement Test Two.

The comparison of the effects of the three treatments was made in 35 intact classes in elementary schools of the Savannah-Chatham County Public Schools--20 third-grade and 15 sixth-grade classes. There were 480 third-grade subjects and 350 sixth-grade subjects who participated in the study. Classes were randomly assigned to treatment groups. The duration of the study, including testing, was 24 days--April 4 to May 4, 1972.

Research Design and Statistical Analysis

A posttest only design with two observations and three treatments was utilized. Data was analyzed in three ways: 1) a one-way fixed-effects analysis of covariance, with reading as the covariate, using class mean scores of the three treatment groups on Anthropology Achievement Tests One and Two ($p<.15$); 2) a two-factor fixed-effects analysis of variance on Anthropology Achievement Test Two to ascertain if the means of any treatment group differed significantly within any of the four reading levels ($p<.15$); and 3) an analysis of covariance on Anthropology Achievement Tests One and Two using individual student scores to determine if the adjusted means differed significantly ($p<.05$) across treatment groups.

Results of Three Types of Data Analysis

1) F ratios were non-significant at both grades three and six when class means were used as the unit of statistical analysis with reading as the covariate.

2) F ratios were significant ($p<.05$) on Anthropology Achievement Test Two by reading level. At the third grade level, the pre-organizer group scored significantly higher ($p<.05$) than the post-organizer group. The Tukey test indicated a significant interaction between reading and treatment ($p<.05$) for pre-organizer third graders with a reading level of 1.0 to 1.9 as measured by the word meaning section of Form W of the Stanford Achievement Test. At the sixth grade level, Tukey test results showed the post-organizer group scored significantly higher ($p<.05$) than the no-organizer group. There was no significant interaction between reading level and treatment.

3) An analysis of covariance using individual students' scores indicated significant F ratios ($p<.05$) for both grades three and six.

At the third grade level, the no-organizer group scored significantly higher than the pre-organizer group on Test One; both the pre- and no-organizer groups scored significantly higher than the post-organizer group on Test Two ($p<.05$).

At the sixth-grade level, the pre- and post-organizer groups both scored significantly higher than the no-organizer group on Test One; the post-organizer group scored significantly higher than both the pre- and no-organizer groups and the pre-organizer group scored significantly higher than the no-organizer group ($p<.05$).

Conclusion

When class means were used as the unit of statistical analysis, the findings of the main treatment effect were consistent. The data did not produce evidence that pre- or post-organizers facilitate learning of structured anthropology materials at either the third- or sixth-grade level.

The analysis of variance using the reading level design shows a consistent influence on reading on anthropology achievement. Better readers scored higher than did poorer readers, regardless of treatment.

Use of individual student scores for analysis of covariance provided inconsistent results by grade and by treatment. Notwithstanding results which showed statistical significance, analysis by individual student scores are deficient in two ways: from a statistical standpoint, the individuals were not randomly assigned to treatment; from a practical standpoint, the differences in means by treatment group seem to be pedagogically insignificant, even if statistically significant in mean scores as a function of a larger N using the individual as the unit of analysis compared to the smaller N using the class mean as the unit of analysis.

The investigators, therefore, accept the evidence resulting from the analysis of covariance using class means as the unit of statistical analysis that the use of organizers using structured anthropology materials did not facilitate anthropology achievement.

Interpretation and Discussion

The concept of organizer may be more useful for the construction of structured materials, incorporating the principles of concept cluster and differentiation, than it is for the increase in pupil achievement using structured materials. The concept of organizer forced the curriculum writers to write and re-write learning passages (the no-organizer material) so that the organizers could have the operational characteristics specified.

In this study, therefore, the final organizers served simply as a preview (pre-organizer) or a summary (post-organizer). This additional curriculum material merely provided for additional practice

in the use of the concepts completely developed in the structured learning passages.

Where curriculum material is completely structured in the learning passage, the organizer cannot provide additional logical organization. It is possible that the organizer will facilitate the learning of unstructured material not developed according to the principles of generality and subsumption.

Generalizability

This investigation of organizers was limited to an operational definition of organizers, explained in the study. The organizers were used in connection with learning passages which were logically structured according to the principles of generality and subsumption. The materials were pilot tested in schools in which the mean reading level was below the national average. Testing of the concept of another type of organizer, with other types of material, with other subjects might produce results different from this research.

Recommendations

As a result of this study, the investigators recommend a comprehensive research effort in the facilitative effects of meaningful reception learning as a whole. In the past, research has been primarily concerned with the concept of organizer, which is only one component in Ausubel's theory of meaningful verbal learning.

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Introduction

The study was part of the curriculum development program of the Anthropology Curriculum Project at the University of Georgia. The function of the Project is to prepare and evaluate written anthropology materials for elementary schools.

In an effort to relate curriculum development more closely to learning psychology, members of the Project staff became interested in David P. Ausubel's theory of the nature and conditions of meaningful, verbal reception learning. One element of Ausubel's theory, the advance organizer, is of particular interest to the Project staff and was investigated in the study.

Statement of the Problem

The question to be answered in the study was: Are there significant differences in learning among treatment groups using an organizer placed immediately before each learning passage (pre-organizer), treatment groups using an organizer placed immediately after each learning passage (post-organizer), and treatment groups using only the learning passages (no-organizer). The statistical hypothesis, that there were no differences in learning among organizer groups, was tested.

Definition of Terms

The concept of advance organizer, as discussed by Ausubel (1963), is vague. Therefore, the present investigators attempted to operationalize the term "organizer", but no claim is made that it meets all of the criteria espoused by Ausubel.

Organizer refers to written material that serves the function of facilitating the incorporation and retention of subject matter. The organizer provides a brief summary of the more detailed material contained in the learning passage.

The written organizers used in the present study had the following characteristics:

1. presented in narrative expository paragraphs the key concepts of the discipline which were explained in detail in the unit;

2. defined the key concepts in simple rather than complex language;

3. illustrated the key concepts with examples which were further developed and enlarged in the unit;

4. introduced the key concepts, with supporting definition, illustrative, and relational material, in the sequence which the concepts were developed in the unit;

5. arranged the narrative sequence to develop key concepts on the basis of generality and subsumption (major and minor concepts in a cluster, or congerie of related concepts);

6. provided a narrative condensation of the major ideas in the unit;

7. in a terminal position, served as a summary of the unit.

Review of Related Research

A review of research reveals that most studies have 1) reported conflicting results as to the facilitative effect of organizers, 2) not operationally defined the concept of organizer, 3) investigated the effects of the organizer at the college level, 4) been designed to limit classroom interaction during the study, 5) been of a short duration; from one to four class periods, and 6) not been in social studies. A summary of these studies is presented in Table 1. Studies are organized according to findings: those finding significance in favor of written organizers and those finding no significance in favor of written organizers. Studies using multi-media organizers are presented separately from those using written organizers.

TABLE 1

Previous Investigations of the Facilitative Effects of Organizers

Studies Reporting a Facilitative Effect of Advance Organizers

Investigator	Year	Type of Organizer	Number of Subjects	Level and Subject Area	Length of Study	Results
Ausubel	1960	Expository vs. historical passage	120	College: Metallurgy	1 class period	Non-sig.; pre-organizer almost sig. at .01.
Ausubel and Fitzgerald	1961	Expository, comparative, and historical introduction	155	College: Religion	3 class periods plus posttest and delayed posttest	Comparative organizer sig. .05 on posttest. Both organizers sig.: expository .05, comparative .02 on delayed posttest (10 days).
Ausubel and Fitzgerald	1962	Expository vs. introductory passage	143	College: Endrocrinology of Pubescence	2 class periods	Total group non-sig. When blocked by SCAT verbal ability scores, sig. .01 in favor of organizer with students in lower one third group.

TABLE 1 (Cont'd)

Investigator	Year	Type of Organizer	Number of Subjects	Level and Subject Area	Length of Study	Results
Ausubel and Youssef	1963	Advance organizer vs. historical and biographical passage	162	College: Religion	30 minutes per day for 4 days	Organizer sig. .01 when verbal ability held constant. When knowledge of Christianity held constant, advance organizer was sig. .05.
Groteluescher and Sjogren	1968	Earlier version of the organizers used below	48 Graduate Educatio Students	College: Mathematics	1 individually arranged session	Advance organizers facilitated learning especially when materials were prcsented in a partially sequenced manner.
Groteluescher and Sjogren	1968	Three experimental organizers and one historical	24 gifted adults	Adults: Mathematics	1 individually arranged session	Advance organizers facilitated learning especially when materials were presented in a partially sequenced manner.

TABLE 1 (Cont'd)

Investigator	Year	Type of Organizer	Number of Subjects	Level and Subject Area	Length of Study	Results
Allen	1969	Advance organizer vs. introduction	212	Junior High: Social Studies	4 days	Advance organizer facilitated learning of above-average students on the delayed posttest (3 weeks).
Neisworth and others	1969	Advance organizer vs. motivational introduction	184 at each level	Normal Elementary and EMR Adolescents: Science	4 days	Advance organizer sig. on posttest and delayed posttest (14 days) with normal elementary. No. sig. difference among EMR adolescents on posttest or delayed posttest.
Steinbrink	1970	Daily advance organizer vs. no daily advance organizer	156	Elementary: Social Studies	5 weeks	Advance organizer sig. on posttest.

TABLE 1 (Cont'd)

Studies Reporting No Facilitative Effects of Advance Organizers

Investigator	Year	Type of Organizer	Number of Subjects	Level and Subject Area	Length of Study	Results
Woodward	1966	Advance organizer and post-organizer	27	College: Mathematics	?	Non-sig.
Bauman, Glass and Harrington	1969	Advance, post- and no-organizer	34	College: Psychology	1 class period	Post-organizer sig. .05.
Bauman, Glass and Harrington	1969	Advance, post- and no-organizer	21	College: Statistics	1 class period	Post-organizer sig. .005 when advance and post-organizers were compared. No sig. difference .10 when scores of pre- and post-organizers were averaged and compared with no-organizer.

TABLE 1 (Cont'd)

Investigator	Year	Type of Organizer	Number of Subjects	Level and Subject Area	Length of Study	Results
Bauman, Glass and Harrington	1969	Advance, post- and no-organizer	21	College: Statistics	1 class period	Post-organizer sig. .05 when advance and post-organizers were compared. No sig. difference .10 when scores of pre- and post-organizers were averaged and compared with no-organizer.
Jerrolds	1967	Advance organizer, modified advance organizer, no-organizer	84	High School: Reading (espionage)	1 class period	No sig. difference among groups on posttest or delayed posttest (4 days). Students who scored below the 49th percentile on the ITBS not included.
Neisworth	1967	Advance organizer vs. introduction	180	High School: Accidental poisoning	4 days	No sig. difference on posttest and on delayed posttest (20 days).

TABLE 1 (Cont'd)

Investigator	Year	Type of Organizer	Number of Subjects	Level and Subject Area	Length of Study	Results
Schulz	1966	Advance organizer vs. no-organizer	376	Elementary: Science	20 weeks	No statistically sig. difference on the posttest or the delayed posttest (10 weeks).
		Studies Using Multi-Media Organizers				
Scandura and Wells	1967	Organizer in the form of a game vs. historical introduction	104	College: Mathematics	1 class period	Organizer in the form of a game sig. .05.
Weisberg	1970	2 types of visual advance organizers, one written expository organizer, and no-organizer	96	Elementary: Science	1 class period	Both visual organizers sig. .05. No sig. difference between written expository organizer group and control group.

TABLE 1 (Cont'd)

Investigator	Year	Type of Organizer	Number of Subjects	Level and Subject Area	Length of Study	Results
Livingston	1970	Advance organizer (simulation game) vs. no-organizer	22	Elementary: Geography	1 class period	No sig. difference.
Livingston	1970	Advance organizer (simulation game) vs. no-organizer	40	High School: Geography	1 week	No sig. difference.
Livingston	1970	Advance organizer (simulation game) vs. no-organizer	32	Elementary: Geography	1 week	No sig. difference.
Barron	1971	Graphic organizer, prose organizer, and no-organizer	?	High School: Astronomy	1 class period (30 minutes)	No sig. difference at any grade level.

Significance of the Present Study

The review of the literature raises several questions. The first is, "What is an organizer?" The vagueness with which Ausubel defined the term has contributed to confusion in evaluating the results of research. Allen (1969) and Steinbrink (1970), for example, both wrote that they constructed organizers according to Ausubel's criteria. Their organizers, however, are very dissimilar. As with most other studies reviewed, they did not operationally define their organizers. As a result, the criteria for their organizers can be only inferred from samples of their treatment material.

The present study was an attempt to fulfill the need to operationally define an organizer. This attempt should facilitate replication and may enable future researchers to write improved organizers. It also provides the reader with a basis for accepting or rejecting the conclusions of the present study in terms of the definition of the organizers used in the study.

The second question that came from the review of related literature is, "Do written organizers facilitate learning in the elementary grades in intact class settings?" Of the 23 studies reviewed, only 6 were conducted with elementary age children. The results of these elementary studies are conflicting. Three found that organizers facilitate learning while three did not. None of the studies reviewed were conducted below the fifth grade.

The present study was an attempt to test the facilitative effects of organizers in intact classes at both the third- and sixth-grade levels.

The third question raised by a review of related literature was, "Do written organizers facilitate learning in social studies with elementary grade children?" Only three studies, one conducted by Steinbrink (1970) and two conducted by Livingston (1970) were in the social studies subject area. Of the three, only Steinbrink (1970) used written organizers. The results of Steinbrink's study cannot be considered conclusive for three reasons: his subjects were not randomly assigned to treatment groups; his pre-organizer group scored significantly higher on a standardized reading achievement test than did his post-organizer group; and the use of individual students as the unit of statistical analysis is questioned because of possible lack of independence among subjects.

The present study was an attempt to extend the Steinbrink study. Like Steinbrink, this study used intact classes, written expository organizers, and a treatment time period of about 25 days. While Steinbrink failed to specify his criteria, he utilized the principle of

major and subsuming concepts in writing his organizers. The organizers are therefore similar to those used in this study.

There are nevertheless several differences between the two studies. In the present study all classes but one were randomly assigned to treatment groups, whereas none of Steinbrink's classes were randomly assigned. In the present study reading score differences were not significant among the three groups at either grade level, whereas Steinbrink found significant differences in reading between groups. In the present study class mean scores were used as the unit of statistical analysis to ensure independence, although the data were also analyzed by reading level and by individual student score to determine the effects of these varying procedures. Steinbrink used only individual student scores. In the present study three treatment groups, pre-organizer, post-organizer, and no-organizer, were used, whereas Steinbrink used two groups, pre-organizer and post-organizer.

The fourth question raised by a review of the literature was, "Do written organizers facilitate learning over an extended period of time?" Of the 23 studies reviewed, 21 were of relatively short duration. Nine lasted only 1 class period and 12 lasted from 2 to 5 days. Only 2, Schulz (1966) and Steinbrink (1970) were longer than 1 week in duration. Questions regarding Steinbrink's study have been discussed above. Schulz's study is also inconclusive. He administered an advance organizer to one of his treatment groups at the beginning of his study and another one 12 weeks later. Then, 20 weeks after the study was initiated and had been interrupted by Christmas vacation, he administered the posttest. It is not surprising that he found no significant differences between the advance-organizer and no-organizer groups because only two organizers were used over the 20 week period.

This raises the fifth question, "How often should organizers be used in instructional units that last several weeks?" Of the two long term studies reviewed, Steinbrink (1970) used an introductory unit organizer and daily lesson organizers for the advance-organizer treatment. Schulz (1966) used only two organizers in a 20 week period.

In the present study, which lasted 24 days, 10 organizers were used at the third-grade level and 16 at the sixth-grade level. The third-grade study used 1 unit, 3 chapter, and 6 sub-chapter organizers. The sixth-grade study used 4 chapter and 12 sub-chapter organizers. At both grade levels the sub-chapter organizers were introduced where there were major conceptual breaks in the logical organization of the materials.

Limits of the Study

The present study was limited to an investigation of the effects of organizers on learning. It was further limited to the effects of written organizers that met the criteria specified by the investigators.

A second limitation of the study resulted from the application of organizers to structured anthropology materials.

A third limitation of the study was the use of an available pool of 35 third- and sixth-grade classes in the Savannah-Chatham County School System. This population could not be considered as representative of a national sample. The subjects were below the national average in reading word knowledge as measured by the Stanford Achievement Test. In addition, the ethnic composition of the sample did not follow national ratios. In the present study, approximately 50 percent of the students were black. This is considerably larger than the national percentage of 11.2 and the nation-wide percentage of 12.2 for metropolitan areas (U. S. Bureau of Statistics, 1971, pp. 27, 16).

A fourth limitation of the study was the relatively small sample size which resulted from the use of class means rather than individual pupil scores as the unit of analysis. Obtaining statistically significant results are unlikely when small sample sizes are used.

A fifth limitation of the study was that systematic observations were not made in the participating classes during the treatment period to ensure that written and oral directions were being followed. Oral directions were provided prior to the start of the treatment and each teacher was given written directions and a detailed time schedule to follow. In addition, each teacher and her students were given textbooks and student study guides which were published in the format that their class was to follow. The investigators made weekly visits and telephone contacts with the participating schools. These procedures strengthen the assumption that the teachers followed the procedures outlined but the degree to which individual teachers may have deviated from established procedures cannot be determined.

Methodologies and Procedures

This section contains a discussion of the construction of curriculum materials, the pilot and experimental studies, test construction and administration, control and description of contextual variables, and the statistical procedures.

Construction of Curriculum Materials

Investigator prepared student materials were used in the present study. The third-grade student text, The Changing World Today: Case Studies of Modernization in Japan, Kenya, and India, Publication Number 72-1, and the sixth-grade text, Cultural Change in Mexico and the United States, Publication Number 72-5, were published by the Anthropology Curriculum Project, University of Georgia. The textbooks were published in three formats: pre-organizers, post-organizers, and no-organizers. Within each grade level the student textbooks were identical except for the position or absence of organizers. In the pre- and post-organizer textbooks, the organizers were identical. In the pre-organizer textbooks, the organizers preceded the learning passages. In the post-organizer textbooks, the organizers were placed after the learning passages.

In addition to the textbooks, student study guides were used at each grade level.

Pilot Study

A pilot study was conducted at each grade level to establish test reliability. Fifteen test items from the third-grade pilot mid-term were used to improve reliability of the final test, Anthropology Achievement Test Number Two, Grade Three. Thirty test items from the sixth-grade pilot mid-term were used to improve reliability of the final test, Anthropology Achievement Test Number Two, Grade Six. Pilot test reliability and item analysis were compiled as part of the Test Scorer and Statistical Analysis computer program. A summary of the test reliability is reported in Table 2. Tables of specifications are reported in Appendix A.

Experimental Studies

Sample selection. Thirty-five classes in five schools in the Savannah-Chatham County Public Schools in Georgia participated in the experimental study: 20 third-grade and 15 sixth-grade classes.

TABLE 2

Reliability Coefficients of Pilot Anthropology
Achievement Test Number One
Grade Three and Grade Six

Grade	Reliability Coefficient (KR-20)
3	.85
6	.73

Random Assignment of Classes to Treatment Groups

There were two steps in the randomization procedure at each grade level. First, classes were randomly assigned to three groups. Second, treatments were randomly assigned to groups. At the sixth-grade level one additional class was added to the study after the other classes had been randomly assigned. This class was arbitrarily assigned to the smallest group (no-organizer).

Orientation of Teachers

Orientation meetings were held for all teachers and principals who participated in the study. Each teacher was provided with written instructions regarding procedures to be followed during the study. In addition, teachers were given textbooks and student study guides that were published in the format that their class was to follow. No attempt was made to train the participating teachers in the teaching of anthropology because such training does not result in increased pupil achievement (Greene, 1966).

Duration of the Study

The study was conducted over a 24 day period, from April 4 to May 4, 1972.

Unit of Statistical Analysis

Class means were used as the unit of statistical analysis in the present study because there was some concern over whether or not individual student scores would meet the requirement of independence (Glass & Stanley, 1970, pp. 505-508). Class means were used because the research was conducted in intact classes where there was interaction among pupils and between teachers and pupils. In addition the data were analyzed by reading level and by individual student score to determine the effects of varying statistical procedures.

Description and Administration of Anthropology Achievement Tests

Two anthropology achievement tests were administered to the experimental classes at each grade level. Anthropology Achievement Test Number One, Third Grade was administered after 6 days of instruction and Anthropology Achievement Test Number One, Sixth Grade was administered after 10 days of instruction. Anthropology Achievement Test Number Two, Third Grade and Anthropology Achievement Test Number Two, Sixth Grade were administered at the end of the experimental treatment period. See Appendix B, pages 54-75. All four achievement tests were investigator-constructed norm referenced tests. The third-grade tests were 30 item, three-option multiple-choice instruments. The final sixth-grade test was a 40 item, four-option multiple-choice instrument. To reduce the influence of word recognition skills, all tests were read orally by the teachers as the students read them silently.

Construction and Characteristics of the Tests

Content validity and test reliability were important considerations in the construction of all tests.

Anthropology Achievement Tests Number One. The procedures followed for establishing content validity for the third- and sixth-grade tests were identical. Questions were used in the Anthropology Achievement Test Number One that sampled all key concepts presented in the appropriate chapters of the texts. See Appendix C, pages 77-86 for the tables of specifications. A balance among definitional, example, and application questions was maintained.

Test data from three randomly selected classes - three, Grade Three and three, Grade Six - were analyzed by means of the TSSA computer program and are reported in Table 3.

TABLE 3

Reliability Coefficients of Anthropology Achievement Test Number One for Three Selected Classes from Grade Three and Three Selected Classes from Grade Six

Grade	Reliability Coefficient (KR-20)
3	.71
6	.80

Anthropology Achievement Tests Number Two. Test data from the pilot study mid-term (Pilot Anthropology Achievement Test) were used to improve reliability of Anthropology Achievement Test Number Two. Data from pilot tests were analyzed. Fifteen questions from the third-grade test and 30 questions from the sixth-grade test that best met the criteria of content validity and test reliability were selected to be used in Anthropology Achievement Test Number Two. The data from the pilot test were used in the following manner:

1. Key concepts from the student texts were once again reviewed and concepts were selected to be included in the final examination.

2. Item analysis data were examined from the pilot study. See Appendix A, pages 48-52. Item difficulty and point biserial correlation of items with the total test score were examined. Items with a high point biserial correlation with the total test score were judged to be superior to items with low correlation.

3. Student response to individual foils were also examined. In some cases the stems were reworded, and in others foils were changed in the hope that the item would function better.

The remaining 15 items were selected to sample the concepts from chapter three at the third-grade and 10 items were selected from chapter five at the sixth-grade level. The procedures followed in selecting and writing items were identical to those used in constructing the pilot test and Anthropology Achievement Test One (third and sixth grade) which

were previously described.

Reliability coefficients for Anthropology Achievement Test Two appear in Table 4.

TABLE 4

Reliability Coefficients of Anthropology
Achievement Test Number Two
Grade Three and Grade Six

Grade	Reliability Coefficient (KR-20)
3	.78
6	.81

Control and Description of Contextual Variables

The research design does not take into account contextual or situational variables that might cause a difference between group means. The investigators dealt with these variables in two ways: Whenever possible, direct control of the variable was exercised. Where this was impractical, the variable was described systematically.

Direct control was exercised over the treatment materials, directions to teachers, total duration of the treatment, and test administrations.

Due to the limitation of experimenting with existing classes which functioned within the framework of the school and the school system, there were some contextual variables that could not be controlled by the investigators.

The five schools that participated in the study were similar in organizational patterns and student populations. They were racially integrated for the first time during the current school year. All classes in the study were integrated. All but two classes were self-contained and were taught by the classroom teacher. The observed

differences among the treatment groups regarding the personal attributes of the teachers were deemed to be minor. The investigators concluded that there were no contextual variables, other than treatment, that accounted for observed differences among treatment groups on the anthropology achievement tests.

Reading Test Data

There is evidence to indicate that reading achievement is highly correlated with anthropology achievement (Greene, 1966; Thomas, 1967; Wash, 1967). Therefore, reading achievement was selected as the covariate in the present study.

The word meaning section of the Stanford Achievement Test, Battery II, Primary II Reading Test, Form W (Kelly et al., 1964) was administered to the third-grade subjects. The reading vocabulary section of the California Achievement Test, Elementary, Form W (Tiegs et al., 1957) was administered to the sixth-grade subjects. During the preliminary stages of the study the Project Director's request to administer a total standardized reading test to the students in the study was discouraged by school personnel. They were reluctant to grant permission because of recent parental concern over the use of standardized testing results. However, school personnel did agree to allow the word meaning and vocabulary sections of the tests to be administered. Since it is generally accepted that word meaning knowledge and vocabulary are highly correlated with the total reading ability, the word meaning and vocabulary sections of the tests were considered to be sufficient. A summary of reading word knowledge data for the third grade and vocabulary achievement for the sixth grade appears in Appendix D.

Statistical Procedures

The data were analyzed three ways:

1) A one-way fixed-effects analysis of covariance, with reading as the covariate, was conducted using the class mean scores of the three treatment groups on Anthropology Achievement Tests One and Two at each grade level to determine if the adjusted mean scores differed significantly ($p<.15$) across treatment groups. Reading word meaning knowledge was used as the covariate at the third-grade level and reading vocabulary achievement at the sixth-grade level. The application of the analysis of covariance partialed out differences in reading among the treatment groups and reduced the experimental error caused by initial differences in reading achievement. The computer program used in data analysis was the Modified University of Georgia Analysis of Least Squares (MUGALS).

2) A two-factor fixed-effects analysis of variance was conducted on Anthropology Achievement Test Two to determine if the means of any of the treatment groups differed significantly ($p<.15$) within any of the four reading levels. MUGALS was used in data analysis.

3) An analysis of covariance was conducted on Anthropology Achievement Tests One and Two using individual student scores to determine if the adjusted means differed significantly ($p<.05$) across treatment groups. Reading word meaning knowledge was used as the covariate at the third-grade level and reading vocabulary achievement at the sixth-grade level. MUGALS was used in data analysis.

Results

Results are presented separately for each of the three methods of analysis: covariance using class means, variance by reading level, and covariance using individual student scores.

Analysis of Covariance Using Class Means

The computed F ratios to test the null hypothesis were non-significant at both grade levels when class means were used as the unit of statistical analysis with reading as covariate. The observed differences among adjusted means were interpreted as a function of chance. A summary of the results of Tests One and Two at the third-grade level, based on an analysis of covariance using class means, appears in Tables 5, 6, 7, and 8. A summary of the results of the sixth-grade tests appears in Tables 9, 10, 11, and 12. Individual class data appear in Appendix D, pp. 88-92.

TABLE 5

Comparison of Adjusted Mean Scores on
Anthropology Achievement Test Number One
Using Word Meaning Knowledge as the Covariate
Grade Three

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	19	99.38		
Treatment	2	7.66	3.83	1.37
Reading Achievement	1	54.48	54.48	19.42*
Error	16	44.89	2.80	

*p<.15.

TABLE 6

Raw Mean Scores and Adjusted Mean Scores for
Treatment Groups on
Anthropology Achievement Test Number One
Grade Three

Treatment	Raw Mean Scores	Adjusted Mean Scores
Pre-organizer	15.30	14.35
Post-organizer	15.33	15.51
No-organizer	15.33	15.97

TABLE 7

Comparison of Adjusted Mean Scores on
Anthropology Achievement Test Number Two
Using Word Meaning Knowledge as the Covariate
Grade Three

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	19	189.51		
Treatment	2	11.22	5.61	1.34
Reading Achievement	1	110.39	110.39	26.28*
Error	16	67.26	4.20	

*p<.15.

TABLE 8

Raw Mean Scores and Adjusted Mean Scores for
Treatment Groups on
Anthropology Achievement Test Number Two
Grade Three

Treatment	Raw Mean Scores	Adjusted Mean Scores
Pre-organizer	18.09	16.73
Post-organizer	16.19	16.43
No-organizer	17.25	18.16

TABLE 9

Comparison of Adjusted Mean Scores on
Anthropology Achievement Test Number One
Using Reading Vocabulary as the Covariate
Grade Six

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	11	220.05		
Treatment	1	3.70	3.70	.35
Reading Achievement	1	108.86	108.86	10.34*
Error	9	94.74	10.53	

*p<.15.

TABLE 10

Raw Mean Scores and Adjusted Mean Scores for
Treatment Groups on
Anthropology Achievement Test Number One
Grade Six

Treatment	Raw Mean Scores	Adjusted Mean Scores
Pre-organizer	23.49	24.09
Post-organizer	25.83	25.22

TABLE 11

Comparison of Adjusted Mean Scores on
Anthropology Achievement Test Number Two
Using Reading Vocabulary as the Covariate
Grade Six

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	11	98.88		
Treatment	1	6.95	6.95	.81
Reading Achievement	1	10.18	10.18	1.18
Error	9	77.62	8.62	

TABLE 12

Raw Mean Scores and Adjusted Mean Scores for
Treatment Groups on
Anthropology Achievement Test Number Two
Grade Six

Treatment	Raw Mean Scores	Adjusted Mean Scores
Pre-organizer	22.71	22.87
Post-organizer	24.67	24.45

Analysis of Variance by Reading Level

When a two-factor fixed-effects analysis of variance was conducted on Anthropology Achievement Test Two at the third- and sixth-grade levels, the overall F ratios were significant ($p<.05$) at both grade levels. Table 13 presents the third-grade data and Table 14 presents the sixth-grade data. The Tukey test was used to determine which groups differed significantly. A summary of the third-grade results appears in Table 15 and a summary of the sixth-grade results appears in Table 16.

At the third-grade level the pre-organizer group scored significantly higher ($p<.05$) than the post-organizer group. No significant differences were found between the pre- and no-organizer groups or between the post- and no-organizer groups. The test also revealed that interaction between reading and treatment was significant at some reading level. In order to locate that reading level, the Tukey test was used to compare each reading-treatment cell in Table 17. Significant interaction ($p<.05$) was found between reading and treatment in one cell only. The data revealed that interaction between reading and treatment was significant with students in the pre-organizer group whose reading level was 1.0 to 1.9. It appears that third-grade students who read at the first-grade level learn more anthropology when presented with pre-organizers.

At the sixth-grade level the Tukey test results showed that the post-organizer group scored significantly higher ($p<.05$) than the no-organizer group. No significant differences were found between the pre- and post-organizer groups or between the pre- and no-organizer groups. There was no significant interaction between reading and treatment in any of the cells in Table 18.

TABLE 13

Comparison of Mean Scores by Reading Level on
Anthropology Achievement Test Number Two
Grade Three

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	482	13480.66	27.97	
Treatment	2	167.17	83.58	5.17*
Reading Achievement	3	5190.96	173.03	107.00*
Treatment - Reading Interaction	6	296.83	49.47	3.06*
Error	471	7620.08	16.18	

*p<.05.

TABLE 14

Comparison of Mean Scores by Reading Level on
Anthropology Achievement Test Number Two
Grade Six

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	355	14344.24	40.40	
Treatment	2	766.99	383.49	14.28*
Reading Achievement	3	4046.08	1348.69	50.22*
Treatment - Reading Interaction	6	222.47	37.08	1.38
Error	344	9239.27	26.86	

*p<.05.

TABLE 15

Summary of Results of the Tukey Test
to Determine Significant Differences ($p<.05$)
Among Treatment Groups at the Third Grade Level

Treatment	Homogeneous With
Pre-organizer	No-organizer
Post-organizer	No-organizer
No-organizer	Pre-organizer and Post-organizer

TABLE 16

Summary of Results of the Tukey Test
to Determine Significant Differences ($p<.05$)
Among Treatment Groups at the Sixth Grade Level

Treatment	Homogeneous With
Pre-organizer	Post-organizer and No-organizer
Post-organizer	Pre-organizer
No-organizer	Pre-organizer

TABLE 17

Raw Means by Reading Level and Treatment on
Anthropology Achievement Test Number Two
Grade Three

Reading Grade Placement Scores		Treatment			Combined
		Pre-organizer	Post-organizer	No-organizer	
	N	9	19	38	66
1	Mean	16.89	11.32	12.26	12.62
1.0 - 1.9	SD	3.98	3.47	3.16	
	N	48	52	65	165
2	Mean	15.65	14.52	14.88	14.99
2.0 - 2.9	SD	3.90	4.27	3.43	
	N	58	60	46	164
3	Mean	18.19	17.45	19.57	18.30
3.0 - 3.9	SD	3.83	4.92	4.18	
	N	39	23	26	88
4	Mean	22.77	21.70	24.65	23.05
> 3.9	SD	4.15	5.43	2.47	
Total Col					Total
	N	154	154	175	483
	Mean	18.48	16.34	16.99	17.26

TABLE 18

Raw Means by Reading Level and Treatment on
Anthropology Achievement Test Number Two
Grade Six

Reading Grade Placement Scores		Treatment			Combined
		Pre-organizer	Post-organizer	No-organizer	
1	N	47	34	23	104
< 5.3	Mean	20.09	20.68	17.30	19.66
	SD	6.97	6.49	4.37	
2	N	44	64	19	127
5.3 - 6.3	Mean	22.05	23.27	18.58	22.14
	SD	4.76	4.52	5.28	
3	N	29	28	14	71
6.4 - 7.2	Mean	24.93	25.75	24.64	25.20
	SD	5.22	3.90	4.75	
4	N	15	26	13	54
> 7.2	Mean	28.60	32.73	25.54	29.85
	SD	4.64	4.61	3.31	
Total Col	N	135	152	69	356
	Mean	22.71	24.76	20.70	23.20

Analysis of Covariance Using Individual Scores

When an analysis of covariance was conducted using individual student scores, the overall F ratios were significant ($p<.05$) on Anthropology Achievement Tests One and Two at both grade levels. A summary of the results for the third grade, when individual scores were used and analyzed by covariance, appears in Tables 19 and 20. A summary of the results for the sixth grade appears in Tables 21 and 22. The Duncan Multiple Range Test was conducted as part of the MUGALS program. A significant difference ($p<.05$) was found between the adjusted mean of the no-organizer group and the pre-organizer group on Test One at the third-grade level. The no-organizer group scored significantly higher than the pre-organizer group. No significant differences were found between the other groups. On Test Two at the third-grade level significant differences ($p<.05$) were found between the post-organizer group and the other two groups. Both the pre- and no-organizer groups scored significantly higher than the post-organizer group. These differences are summarized in Tables 23 and 24.

At the sixth-grade level on Test One the pre- and post-organizer groups both scored significantly higher ($p<.05$) than the no-organizer group. No significant differences were found between the pre- and post-organizer groups.

Significant differences ($p<.05$) were found between all three groups on Test Two at the sixth-grade level. The post-organizer group scored significantly higher than both the pre- and no-organizer groups and the pre-organizer group scored significantly higher than the no-organizer group. A summary of the results of Anthropology Achievement Tests One and Two at the sixth-grade level, when an analysis of covariance was conducted using individual student scores, appears in Tables 21 and 22. The results of the Duncan Multiple Range Test appear in Tables 25 and 26.

TABLE 19

Comparison of Individual Student Scores on Anthropology Achievement Test Number One Using Word Meaning Knowledge as the Covariate Grade Three

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	490	9980.64		
Treatment	2	152.18	76.09	6.01*
Reading Achievement	1	3814.76	3814.76	301.37*
Error	487	6164.39	12.66	

*p<.05.

TABLE 20

Comparison of Individual Student Scores on
Anthropology Achievement Test Number Two
Using Word Meaning Knowledge as the Covariate
Grade Three

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	481	13581.78		
Treatment	2	194.98	97.49	5.95*
Reading Achievement	1	5373.95	5373.95	328.15*
Error	478	7827.95	16.38	

*p<.05.

TABLE 21

Comparison of Individual Student Scores on
Anthropology Achievement Test Number One
Using Reading Vocabulary as the Covariate
Grade Six

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	350	20437.72		
Treatment	2	779.35	389.68	11.14*
Reading Achievement	1	7234.40	7234.40	206.78*
Error	347	12139.88	34.99	

*p<.05.

TABLE 22

Comparison of Individual Student Scores on Anthropology Achievement Test Number Two Using Reading Vocabulary as the Covariate Grade Six

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
Total	357	14360.44		
Treatment	2	594.10	297.05	10.13*
Reading Achievement	1	3187.45	3187.45	108.70*
Error	354	10380.35	29.32	

*p<.05.

TABLE 23

Summary of Results of the Duncan Multiple Range Test to Determine Significant Differences ($p<.05$) Among Treatment Groups on Anthropology Achievement Test One at the Third Grade Level

Treatment	Homogeneous With
Pre-organizer	Post-organizer
Post-organizer	Pre-organizer and No-organizer
No-organizer	Post-organizer

TABLE 24

Summary of Results of the Duncan Multiple Range Test to Determine Significant Differences ($p<.05$) Among Treatment Groups on Anthropology Achievement Test Two at the Third Grade Level

Treatment	Homogeneous With
Pre-organizer	Post-organizer
Post-organizer	Post-organizer Only
No-organizer	Pre-organizer

TABLE 25

Summary of Results of the Duncan Multiple Range Test to Determine Significant Differences ($p<.05$) Among Treatment Groups on Anthropology Achievement Test One at the Sixth Grade Level

Treatment	Homogeneous With
Pre-organizer	Post-organizer
Post-organizer	Pre-organizer
No-organizer	No-organizer only

TABLE 26

Summary of Results of the Duncan Multiple Range Test to Determine Significant Differences ($p<.05$) Among Treatment Groups on Anthropology Achievement Test One at the Sixth Grade Level

Treatment	Homogeneous With
Pre-organizer	Pre-organizer Only
Post-organizer	Post-organizer Only
No-organizer	No-organizer Only

Conclusions

When class means were used as the unit of statistical analysis, the findings of the main treatment effect were consistent. The data did not produce evidence that pre- or post-organizers facilitate learning of structured anthropology materials at either the third or sixth grade.

The analysis of variance using the reading level design revealed a consistent influence of reading on anthropology achievement. Better readers scored higher on Anthropology Achievement Test Number Two at both grade levels than did poorer readers, regardless of treatment. The data also indicated that pre-organizers facilitated learning among third-grade students who read at the first-grade level.

When individual student scores were used as the unit of statistical analysis, the results were inconsistent. On Anthropology Achievement Test One at the third-grade level it appears that organizers did not facilitate learning, while post-organizers facilitated learning on Test Two. On Anthropology Achievement Test One at the sixth-grade level both pre- and post-organizers facilitated learning better than either pre- or no-organizers.

The reader is cautioned not to place too much emphasis on the fact that statistically significant results were found when the data were analyzed by reading level and by individual student score. There are two reasons for this. First, neither of these analyses by reading level or treatment using individual student scores met the conditions of randomization and independence required for rigorous statistical analysis. Intact classes were randomly assigned to treatment groups. Individual students were not randomly assigned, nor were students or groups within specified reading levels randomly assigned to treatments. Therefore, the results of the study when analyzed in any way other than by class means are subject to serious limitations.

The investigators accept the evidence resulting from the analysis of covariance when class means were used as the unit of statistical analysis. That evidence indicates that pre- and post-organizers did not facilitate learning among the subjects in the study when Georgia Anthropology Curriculum materials were used at the third- and sixth-grade levels. The additional analysis procedures were conducted primarily to determine what effects, if any, result from the use of differing statistical procedures.

The second reason why great emphasis should not be placed on the significant results which were found in two of the three procedures used was that statistical differences do not imply practical or

educational differences. The investigators believe that there were no differences in anthropology achievement by reading level by treatment great enough to be considered of practical value to school people. This belief is restricted to the use of organizers such as those used in the present study, when used with students whose characteristics are similar to those in the study, and when using structured materials and organizers similar to those written for this study. The structured, conceptually organized nature of the content in the no-organizer treatment may have been so highly organized as to preclude any facilitative effects of the pre- and post-organizers that were constructed for use with the materials.

The conclusion that organizers did not facilitate learning in the present study should not be generalized beyond the experimental context. Organizers may, indeed, facilitate learning when written according to different criteria, when used with students whose characteristics are different from those in the study, or when less highly structured curriculum materials are used. Further research is needed to resolve this question.

Recommendations

Based on the findings, observations, and conclusions of the present study, the investigators submit the following specific recommendations for further research relating to the facilitative effects of organizers.

1. This study should be replicated in its present design with third and sixth graders with higher academic abilities.

2. This study should be replicated in its present design with students at higher grade levels.

The organizers, as operationally defined in the present study, more nearly meet Ausubel's criteria of presenting the student with a brief summary of the more detailed material at a higher level of abstraction, generality, and inclusiveness. However, Ausubel's distinction between organizers and overviews was not a part of the present study. To investigate the effects of organizers and overviews the following recommendation is made:

3. A study should be designed to compare the effects of organizers written at varying levels of abstraction, generality, and inclusiveness. Ausubel (1963, p. 214) attempted to distinguish between general overviews and organizers. If these can be operationally

defined so as to be distinguishable, a comparative study would contribute to an understanding of the effects of different types of introductory passages.

It is quite possible that organizers facilitate learning for some students but not for others. This possibility was not investigated in the present study.

4. Studies should be designed with students blocked by verbal ability, reading level, age, sex, and other criteria that may make a difference in learning potential or style to determine if students with particular attributes may benefit from using curriculum materials with pre- or post-organizers.

The current literature reveals an interest in the use of games, graphs, maps, and other media as organizers. The results of these studies are inconclusive. Some researchers (Scandura & Wells, 1967; Weisberg, 1970) found that multi-media organizers facilitated learning while others (Livingston, 1970; Barron, 1971) reported no such facilitative effects.

5. Studies should be designed to compare the facilitative effects of different types of organizers: multi-media as well as expository.

In addition to the need for further research regarding organizers, other elements of Ausubel's theory of meaningful, verbal reception learning should be investigated. Several of these elements fall within the concepts of practice and instructional materials. Task variables which pertain to practice include amount, distribution, type, and method of practice as well as the influence of task homogeneity, learning set, knowledge of results, task size, and the internal logic and organization of instructional materials.

Amount of practice was not precisely controlled in the present study; however, total duration of the study was specified by the investigator and was adhered to by all participating teachers. Treatment groups using no-organizers spent the same number of days in the study as groups using organizers. This provided more time for the no-organizer group to review and discuss the learning passages. Had the duration of the study not been held constant, the no-organizer group might have completed the study in a shorter period of time thus decreasing the amount of practice for that group. In contrast, the organizer groups might have taken the same amount of time or even more time, thus benefiting from additional practice.

6. Studies should be designed to investigate the effects of varying amounts of practice.

A second task variable that needs investigation is that of distribution of practice. The question of distribution of practice typically refers to whether practice is intense or distributed and involves elements of forgetting which result from passage of time or interference of subsequently learned material.

In the present study measurement of learning and retention occurred at two different intervals for all treatment groups. The first test was administered after 6 days of instruction and the second after 24 days. There was no difference, therefore, in the distribution of practice for any treatment group. Theoretically, the organizer groups had opportunities for more intensive practice, but because the logical organization of the content to be learned for all groups was the same and the time of opportunity for learning was the same, the question of distribution of practice was not examined in the context of the study.

7. Studies should be designed to investigate the influence of intense and distributed practice.

Types and methods of practice were not controlled in the present study but were partially specified by the materials and tests used. The types of practice provided were reading the student text, discussing the concepts in class, completing the student study guide, and taking the tests. The organizer groups had additional practice in that they read the organizers as well as the learning passages in their texts. In addition, several teachers reported using audio-visual media, art activities, trade books, resource speakers, and field trips as part of their anthropology teaching units. It is not known what practice effect these experiences had on the learners. The method of practice was built into the anthropology achievement tests and student study guides. It involved a combination of constructed responses and selected responses. In the constructed response items, the students were required to respond to incomplete stems. Definitional, example, and application exercises were used. In addition, selected responses were utilized, of the three- and four-foil, multiple-choice type. These responses were also of the definitional, example, and application types. In addition, there were open-ended questions and involvement exercises. It is not known the extent to which all of these methods were used, but it appears that primary emphasis was given to the constructed and selected responses.

From a theoretical standpoint, the no-organizer group was presented a method of whole learning whereas the organizer groups were presented methods which combined whole and part learning, part learning being represented by the organizer and whole learning being represented by the full text material.

8. Studies should be conducted to investigate the effects of various types and methods of practice.

Task homogeneity is another variable associated with meaningful learning. It refers to the number of contexts in which examples of concepts are presented. No attempt was made in the present study to try to develop heterogeneous as compared with homogeneous tasks. The principle of progressive differentiation and integrative reconciliation, which served as guidelines for development of the materials, required that new concepts and factual information be related to the previously introduced general and more abstract concepts. Therefore, an effort was made to give different examples of the same concept consistent with some concern for total length of the material.

9. Studies should be designed to investigate the effects of using homogeneous and heterogeneous tasks on concept development.

Another task variable associated with meaningful learning is learning set. Ausubel (1963, pp. 202-203) defines two elements of the learning set: "warm up" and learning-to-learn. These components refer to the readiness and willingness of students to learn subject matter in a meaningful fashion rather than merely in a rote manner. One of the possible advantages of the pre-organizer, in contrast with material which has a post-organizer or no-organizer, is that the pre-organizer may function as a "warm up" component which serves to create a predisposition to learn verbal material meaningfully.

In the short term studies reviewed by the present investigator, the advantage of the pre-organizers may be attributed to its function as a "warm up." According to Ausubel, "warm ups" have a short term effect and account at most for part of the improvement in learning that occurs during a single day. The present study lasted over a full month so it is reasonable to assume that any "warm up" effect of the pre-organizer was dissipated over the long time period.

Long term improvement in learning must be accounted for solely in terms of learning-to-learn effects (Ausubel, 1963, p. 203). In the present study the pre-organizer apparently did not function as a learning-to-learn agent.

10. Studies should be designed to investigate the effects of using organizers which are specifically written to provide the student with methodological sophistication in approaching a given learning task (learning-to-learn).

The investigator does not recommend further research into the effects of organizers to serve as "warm ups" because any short term advantage seems to disappear over time (Ausubel, 1963, p. 202).

Another very important variable in learning is knowledge of results. While feedback is frequently interpreted as reinforcement, it may equally well be interpreted as a way in which to help the student construct the desired cognitive structure. In the present study the student study guide provided answer sheets which students could use to check their constructed and selected responses. Students and teachers were not presented knowledge of results on the anthropology achievement tests until after the study was completed. Even then, only raw scores, class mean scores, and treatment mean scores were presented to them. Therefore, neither students nor teachers received knowledge of results on specific items or concepts.

11. Studies should be designed to investigate the effects of knowledge of results.

Another variable in learning is the size of the task to be learned. Subject matter learning tasks constitute a part of a continuum, and it is very difficult to isolate appropriate tasks. In verbal learning, components are usually logically sequential, rather than constituting a hierarchy of difficulty.

In the present study learning tasks were constructed around concept clusters, which consist of a major concept and sub-concepts. Some clusters are complex, as measured by the number of subsumers necessary to elucidate the concept, while others are less complex.

12. Studies should be designed to investigate the effects of task size.

One of the most important variables has to do with difficulty of the instructional material. If it is too difficult, achievement results are small in comparison to effort; if it is too easy, results are meager in terms of time spent. The difficulty of the material is clearly related to and influences learning time, the learning curve, and the amount of material learned and retained. Since task difficulty is related to the individual learner, the present investigator was unable to write instructional materials which anticipated learner variables related to task difficulty.

The materials used in the present study were quite difficult, probably too difficult for the subjects, whose reading word meaning knowledge was approximately 8 months below the national average.

13. Studies should be designed to investigate the appropriateness of the materials, in terms of difficulty, with students at higher grade levels.

The two major programmatic factors of the theory of meaningful,

verbal reception learning concern internal logic and organization of the instructional materials. Progressive differentiation and integrative reconciliation are these two factors. Although the materials used in the present study were developed according to the investigator's interpretation of these two factors, the effects of progressive differentiation and integrative reconciliation were not investigated.

14. Studies should be designed to investigate the effects of using materials written according to progressive differentiation and integrative reconciliation with materials written according to other formats.

Summary of Recommendations

Ausubel's theory of meaningful, verbal reception learning is worthy of continued research. One of the important elements of the theory, the advance organizer, has received the major attention of researchers.

Other task variables need to be systematically analyzed and investigated. Some of these variables include the amount, distribution, type, and method of practice. Other variables include task homogeneity, learning set, knowledge of results, and task size. Two major programmatic factors of the theory concern the internal logic and organization of instructional materials: progressive differentiation and integrative reconciliation.

The series of recommendations listed above are beyond the capabilities of a single investigator working alone. Therefore, it is recommended that a comprehensive study of the theory of meaningful, verbal reception learning be conducted. The present investigator envisions this study as a large scale team effort in which each team member investigates a single task variable yet coordinates his research with that of his colleagues. In this way the theory of meaningful, verbal reception learning, as a whole, can be evaluated. It is felt that this team approach would make a contribution to knowledge far greater than could be gained from the present practice of independent researchers investigating the effects of a single element of the theory.

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APPENDIX A

. Tables of Specifications for Pilot
Anthropology Achievement Tests

TABLE 27

Table of Specifications for Pilot Anthropology Achievement Test - Grade Three

Item Number	Difficulty	Point Biserial Correlation of Items With Total Test Score	Concept Tested
1*[a]	.86	.30	culture
2	.76	.28	traits
3	.81	.52	technology
4	.41	.49	cultural universal
5	.64	.54	material trait
6*	.46	.51	trait variation
7	.40	.52	enculturation
8*[a]	.79	.16	language
9	.54	.27	non-material trait
10*	.55	.65	cultural change
11	.39	.42	cultural universal
12*[b]	.69	.39	cultural change
13*	.82	.46	discovery
14*	.70	.62	invention
15*	.65	.54	diffusion
16	.66	.38	innovation
17	.43	.62	acculturation
18	.55	.50	acculturation
19	.33	.37	diffusion
20*[b]	.53	.30	discovery and invention
21*[b]	.50	.36	diffusion and acculturation
22	.71	.49	enculturation

[a]An attempt was made to improve questions by changing the distractors.
[b]An attempt was made to improve the questions by rewording the stem.
*Items selected from the pilot test to be used in the final examination of students in the experimental treatment population (Anthropology Achievement Test No. Two).

TABLE 27 (Cont'd)

Item Number	Difficulty	Point Biserial Correlation of Items With Total Test Score	Concept Tested
23*	.69	.45	technology
24*	.63	.44	material trait
25*	.54	.35	culture (language)
26*(b)	.44	.53	enculturation
27	.64	.51	material trait
28	.51	.38	cultural change
29	.42	.21	cultural change
30*(b)	.44	.44	cultural change

[a]An attempt was made to improve questions by changing the distractors.
[b]An attempt was made to improve the questions by rewording the stem.
*Items selected from the pilot test to be used in the final examination of students in the experimental treatment population (Anthropology Achievement Test No. Two).

TABLE 28

Table of Specifications

Pilot Anthropology Achievement Test
Grade Six

Item	Specifications				Percent Who Answered Correctly	Point Biserial Correlation With Total Test Score
	Concept	Definition	Example	Application		
1*	culture	x			84	.13
2*	culture		x		66	.27
3*	culture			x	53	.08
4*	language	x			46	.22
5	language		x		33	.02
6	language		x		31	.22
7*	enculturation	x			36	.12
8	enculturation		x		30	.16
9	enculturation		x		31	.24
10*	cultural universal	x			31	.18
11	cultural universal			x	08	.07
12*	cultural universal	x			72	.26
13	trait variation		x		16	.12
14*	trait variation			x	20	.17
15*	cultural traits	x			39	.45
16	cultural traits			x	38	.03

*Items selected from Pilot Anthropology Achievement Test that were used in Anthropology Achievement Test Number Two.

TABLE 28

Table of Specifications

Pilot Anthropology Achievement Test
Grade Six

Item	Specifications				Percent Who Answered Correctly	Point Biserial Correlation With Total Test Score
	Concept	Definition	Example	Application		
17	cultural traits			x	44	.28
18	material traits	x			46	.42
19*	material traits		x		51	.38
20*	non-material traits	x			41	.31
21	non-material traits			x	18	.20
22	non-material traits			x	23	.45
23	cultural change	x			84	.30
24*	cultural change		x		62	.20
25*	cultural change			x	39	.32
26*	modernization	x			46	.48
27*	modernization		x		57	.35
28*	modernization			x	53	.41
29	modernization	x			53	.15
30*	discovery & invention	x			44	.20
31*	discovery			x	53	.53
32*	discovery			x	59	.52
33*	diffusion	x			26	.33

*Items selected from Pilot Anthropology Achievement Test that were used in Anthropology Achievement Test Number Two.

TABLE 28

Table of Specifications

Pilot Anthropology Achievement Test
Grade Six

Item	Specifications				Percent Who Answered Correctly	Point Biserial Correlation With Total Test Score
	Concept	Definition	Example	Application		
34	diffusion			x	13	.15
35	acculturation	x			13	.21
36	cultural stability	x			21	.15
37*	cultural stability			x	28	.16
38	cultural lag	x			28	.20
39*a	cultural lag		x		30	.21
40*	cultural lag			x	33	.20
41*	planned change	x			31	.49
42*	planned change		x		31	.30
43*	planned change			x	41	.32
44	cultural heritage	x			23	.28
45*	cultural heritage		x		39	.38
46*	cultural heritage		x		44	.45
47*	language		x		46	.36
48	language		x		18	.06
49	language		x		06	.06
50*	language		x		53	.35

[a]An attempt was made to improve the question by changing the distractor.
*Items selected from Pilot Anthropology Achievement Test that were used in Anthropology Achievement Test Number Two.

APPENDIX B

. Anthropology Achievement Tests

GENERAL DIRECTIONS

This is a test of the understandings you have developed about cultural change. You should take the test in the same way you would work on any new and interesting problems. Here are a few suggestions which will help you earn your best score.

1. Make sure you understand the directions. If you do not understand any part of the directions, ask the teacher.

2. You will make your best score by answering every question because your score is the number of the correct answers you mark. Mark the answer you think is best.

* * * *

DIRECTIONS

This is an Anthropology test. Read the question and select the best answer. Mark the answer 1, 2, or 3 on the answer sheet. Be certain that the number on the test is the same as the number on the answer sheet. You must mark all of your answers on the separate answer sheet you have been given. The test booklet should not be marked in any way. You must mark your answer sheet by blackening the space having the same letter as the answer you have chosen. For example:

SAMPLE A:
A. Which of the following is a toy?
1. cat
2. boy
3. doll

SAMPLE B:
B. A dog can
1. read
2. bark
3. sing

The Changing World Today

Chapters 1 and 2

1. The way of life of a group of people is called
   1. universals.
   2. culture.
   3. enculturation.

2. Individual units or parts of culture are called
   1. traits.
   2. diffusion.
   3. beliefs.

3. The way things are made is part of
   1. universals.
   2. material traits.
   3. technology.

4. Traits that are found in all cultures are called
   1. technology.
   2. universals.
   3. variations.

5. The parts of culture that can be seen or touched are
   1. material traits.
   2. non-material traits.
   3. trait variations.

6. Most people in the United States speak English. Most people in Japan speak Japanese. English and Japanese are examples of
   1. material traits.
   2. technology.
   3. trait variations.

7. A Japanese child learning to speak Japanese is an example of
   1. enculturation.
   2. acculturation.
   3. diffusion.

8. Man's special way of passing on culture is
   1. technology.
   2. acculturation.
   3. language.

9. A church is a building. It is used for worship. A church is a material trait. Going to church is a
   1. cultural universal.
   2. non-material trait.
   3. stable culture.

10. A culture that changes slowly is a
    1. stable culture.
    2. modern culture.
    3. cultural universal.

11. Music is found in all cultures. Music is a
    1. cultural universal.
    2. part of technology.
    3. material trait.

12. Discovery, invention, diffusion, and acculturation are causes of
    1. stable cultures.
    2. cultural change.
    3. cultural universals.

13. James Marshall found gold in California. Finding the gold is an example of
    1. invention.
    2. diffusion.
    3. discovery.

14. Robert Fulton combined a steam engine and a boat to make a steamboat. The steamboat is an example of
    1. invention.
    2. diffusion.
    3. discovery.

15. English traders traded steel knives for animal furs. The steel knife became a part of Indian cultures. This is an example of
    1. diffusion.
    2. discovery.
    3. invention.

16. New traits that come from within and outside the culture are called
    1. discoveries.
    2. acculturation.
    3. innovations.

17. Along the Rio Grande River, people in the United States and Mexico are close to one another. Mexicans have brought their traits to the United States. Americans have brought their traits to Mexico. This is an example of
    1. acculturation.
    2. enculturation.
    3. discovery.

18. Acculturation takes place when two cultures share cultural traits as a result of
    1. stable cultures.
    2. cultural contact.
    3. innovation.

19. Most new traits come to a culture as a result of
    1. diffusion.
    2. inventions.
    3. discoveries.

20. Changes that come from within the culture come by
    1. diffusion and acculturation.
    2. invention and discovery.
    3. enculturation and innovation.

21. Changes that come from outside the culture come by
    1. diffusion and acculturation.
    2. invention and discovery.
    3. enculturation and innovation.

22. A child first begins to learn the ways of his culture from his
    1. school.
    2. family.
    3. church.

23. Which example shows the highest level of technology?
    1. A man rowing a canoe.
    2. An atomic submarine.
    3. A sailboat.

24. A pencil is made by man. It is an example of
    1. a discovery.
    2. a non-material trait.
    3. a material trait.

25. Only man
    1. has language.
    2. communicates.
    3. uses signs.

26. Mary's mother is teaching her how to bake a cake. This is an example of
    1. diffusion.
    2. acculturation.
    3. enculturation.

27. An example of a material trait is a
    1. rock.
    2. wave.
    3. bicycle.

28. A culture changes mostly by
    1. adding new traits.
    2. dropping old traits.
    3. making new discoveries.

29. Which would you expect to change more rapidly?
    1. Religious practices.
    2. Traditions.
    3. Clothing styles.

30. Culture A has many traits. Culture B has few traits. From what you have learned about cultural change
    1. Culture A will have more changes than Culture B.
    2. Culture B will have more changes than Culture A.
    3. both cultures will have about the same amount of change.

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Anthropology Curriculum Project
Test #2 - Grade Three
May 1972

The Changing World Today

Chapters I, II and III

1. Tokyo is a large city. City areas are
   1. rural areas.
   2. urban areas.
   3. agricultural areas.

2. John speaks English. Tai speaks Korean. English and Korean are examples of
   1. material traits.
   2. technology.
   3. trait variations.

3. The Japanese have many material traits in their culture. The Japanese culture is
   1. changing rapidly.
   2. changing slowly.
   3. staying about the same.

4. Japan sells many goods to the United States. When Japan sells goods tc the United States it is
   1. importing.
   2. manufacturing.
   3. exporting.

5. The Japanese now live longer than ever before. One of the reasons why the Japanese live longer is because of
   1. manufacturing.
   2. modern medicines.
   3. urbanization.

6. Talking and writing are part of
   1. acculturation.
   2. diffusion.
   3. language.

7. To use new methods in the place of old methods is called
   1. modernization.
   2. urbanization.
   3. industrialization.

8. The Japanese chose traits from other countries that they thought would help them modernize. Choosing traits from other countries and making them part of the Japanese culture is an example of
   1. selective diffusion.
   2. urbanization.
   3. industrialization.

9. Which example best shows modernization?
   1. Painting beautiful pictures with great skill.
   2. Building new passenger trains.
   3. Visiting a shrine built long ago.

10. Man's way of living is called
   1. acculturation.
   2. culture.
   3. enculturation.

11. To buy goods from other countries is called
   1. importing.
   2. manufacturing.
   3. exporting.

12. New traits that come both from within and from outside the culture are causes of
   1. stable cultures.
   2. cultural changes.
   3. cultural universals.

13. Before Europeans came to the new world, horses were not part of the culture of the Indians. After the Europeans came to the new world, the horse became part of the culture of the Indians. This is an example of
   1. diffusion.
   2. discovery.
   3. invention.

14. Which example shows the highest level of technology?
   1. A man using a hoe to till the soil.
   2. A man using a tractor to pull the plow.
   3. A man using a horse to pull the plow.

15. Larry's father is teaching Larry to drive the car. This is an example of
   1. diffusion.
   2. acculturation.
   3. enculturation.

16. An example of industrialization is
   1. making beautiful pots by hand.
   2. making motorcycles in a factory.
   3. shopping in the city.

17. Chemicals from the factory made the river impure. Fish could no longer live in the river. The river is
    1. productive.
    2. isolated.
    3. polluted.

18. Pretend that one of your classmates found gold in a creek near his home. Finding the gold is an example of
    1. invention.
    2. diffusion.
    3. discovery.

19. The cities of Japan grew larger as villagers moved to the cities to work in the factories. Farmers and villagers moving to the cities is one cause of
    1. urbanization.
    2. industrialization.
    3. selective diffusion.

20. All cultures change. Some cultures change slowly. A culture with little change is a
    1. stable culture.
    2. modern culture.
    3. cultural universal.

21. Only man is able to
    1. use language.
    2. communicate.
    3. use signs.

22. A school desk is made by man. The school desk is an example of
    1. a discovery.
    2. a non-material trait.
    3. a material trait.

23. The number of people who live in Japan is increasing. The word that means the number of people is
    1. urbanization.
    2. population.
    3. economics.

24. New traits in a culture that come from the people of other cultures are a result of
    1. diffusion and acculturation.
    2. invention and discovery.
    3. enculturation and innovation.

25. Changing iron ore into steel is an example of
    1. manufacturing.
    2. exporting.
    3. urbanization.

26. New traits in a culture that come from the people of the culture are a result of
    1. diffusion and acculturation.
    2. invention and discovery.
    3. enculturation and innovation.

27. Building ships, automobiles, and television sets are examples of Japan's high level of
    1. urbanization.
    2. technology.
    3. isolation.

28. City areas in Japan are growing rapidly. The growth of city areas is called
    1. industrialization.
    2. manufacturing.
    3. urbanization.

29. A scientist combined a gasoline engine and a bicycle to make a motorcycle. The motorcycle is an example of
    1. invention.
    2. diffusion.
    3. discovery.

30. As Japan changed from using mainly manpower to machine power to make things, Japan became more
    1. agricultural.
    2. isolated.
    3. industrialized.

Anthropology Curriculum Project
Cultural Change in Mexico and the United States
Publication No. 72-6B
April 1972 - Grade Six

ANTHROPOLOGY ACHIEVEMENT TEST 1 (Form B)

Cultural Change in Mexico and the United States
Cultural Change in Mexico and the United States

Write your answers on the separate answer sheet.

1. People who live together in the same way are said to belong to the same
   1. culture.
   2. language.
   3. universals.
   4. technology.

2. The games people play, the tools they use, and the religion they believe in is largely determined by their
   1. universals.
   2. culture.
   3. biology.
   4. heredity.

3. Watching bull fights and listening to guitar music are popular with the Spanish because of their
   1. universals.
   2. biology.
   3. culture.
   4. heredity.

4. An important part of culture is
   1. biology.
   2. animals.
   3. heredity.
   4. language.

5. Most children in the United States learn much about the history of their country through
   1. language.
   2. heredity.
   3. biology.
   4. imitation.

6. An important difference between the way that a young animal learns something and the way that a young human learns is that the animal does not learn
   1. through observing.
   2. by imitating.
   3. through language.
   4. from its parents.

7. The process of a child learning the culture into which he is born is called
   1. enculturation.
   2. acculturation.
   3. biology.
   4. technology.

8. A child in the United States who is learning to speak English as a first language is being
   1. modern.
   2. man-made.
   3. acculturated.
   4. enculturated.

9. Pedro lives on an ejido. His father drives a tractor. Sometimes Pedro's father lets him steer the tractor. Pedro is being
   1. enculturated.
   2. acculturated.
   3. modern.
   4. universal.

10. Cultures throughout the world share some of the same cultural needs. These needs are called
    1. universals.
    2. variations.
    3. acculturation.
    4. biology.

11. All cultures in the world have some type of art. Therefore art is a
    1. universal.
    2. variation.
    3. culture.
    4. language.

12. Differences in traits from one culture to another are called
    1. universals.
    2. variations.
    3. enculturation.
    4. technology.

13. People in the United States speak English while people in Mexico speak Spanish. This is an example of a
    1. universal.
    2. variation.
    3 material trait.
    4. biological need.

14. Most people in the United States hold a fork in their right hand when they eat while many Europeans hold a fork in their left hand. This can be considered a
    1. cultural universal.
    2. trait variation.
    3. material trait.
    4. biological need.

15. Culture is made up of individual items and behaviors called
    1. traits.
    2. universals.
    3. heredity.
    4. technology.

16. A knife is an example of a
    1. discovery.
    2. biological need.
    3. hereditary characteristic.
    4. trait.

17. In Mexico, football is played with a round ball. This type of international football is called soccer in the United States. Soccer is an example of a
    1. trait.
    2. universal.
    3. biological need.
    4. hereditary characteristic.

18. Material traits are those that
    1. can be seen and touched.
    2. cannot be seen and touched.
    3. consist of beliefs, values, and habits.
    4. are found only in modern cultures.

19. Highways, factories, and weapons are examples of
    1. language.
    2. material traits.
    3. non-material traits.
    4. heredity.

20. The non-material culture includes
    1. hereditary characteristics.
    2. values, beliefs, and behaviors.
    3. biological needs.
    4. things that can be touched and seen.

21. The custom of a man standing when a lady enters the room is part of the
    1. material culture.
    2. non-material culture.
    3. biological needs.
    4. hereditary characteristics.

22. Things are not the same in any culture today as they were in the past because of
    1. cultural stability.
    2. cultural change.
    3. cultural variations.
    4. cultural lag.

23. Many people travel on airplanes in the United States today while few travel long distances on trains. This is because of
    1. cultural stability.
    2. cultural change.
    3. cultural universals.
    4. resistance to change.

24. In the past many Eskimos lived in snow igloos. Today many live in wooden houses and very few live in igloos. This is referred to as
    1. cultural stability.
    2. cultural change.
    3. cultural lag.
    4. cultural universals.

25. Cultures that are changing from old ways of doing things to new ways are
    1. traditional.
    2. modernizing.
    3. stabilizing.
    4. hereditary.

26. Many Mexican farmers are using tractors instead of plows pulled by oxen. We can say that these farmers are
    1. traditional.
    2. modernizing.
    3. universal.
    4. hereditary.

27. The people of Canada are now using machinery instead of hand tools to make things. Canada is
    1. traditional.
    2. modernizing.
    3. universal.
    4. stabilizing.

28. When people in a culture find something that they did not know about before, they are
    1. making an invention.
    2. making a discovery.
    3. resisting change.
    4. stabilizing the culture.

29. The culture of the United States changed partly because gold was
    1. acculturated.
    2. diffused.
    3. invented.
    4. discovered.

30. The culture of Venezuela changed partly because oil was
    1. invented.
    2. discovered.
    3. diffused.
    4. acculturated.

31. Changes that come from another culture are caused by
    1. diffusion and acculturation.
    2. discovery and invention.
    3. cultural lag.
    4. resistance to change.

32. The language and religion of Mexico were adopted from the Spanish culture through the process of
    1. acculturation.
    2. diffusion.
    3. invention.
    4. discovery.

33. People from other countries who have moved to the United States have adopted the culture of the country. These immigrants had contact with Americans over a long period of time. This process is called
    1. diffusion.
    2. acculturation.
    3. cultural stability.
    4. resistance to change.

34. When people do what is expected of them by their culture, the result is
    1. acceleration of change.
    2. resistance to change.
    3. cultural stability.
    4. cultural instability.

35. In Amish communities in the United States, people live almost the same way that they have in the past. This is an example of
    1. acculturation.
    2. acceleration of change.
    3. cultural instability.
    4. cultural stability.

36. Cultural change that results in traits not working well together is called
    1. resistance to change.
    2. cultural lag.
    3. modernization.
    4. trait variations.

37. The Mexican workers' ideas of work speed was different from the employers' ideas of work speed in the factories. This resulted in
    1. universals.
    2. cultural lag.
    3. biological need.
    4. a hereditary characteristic.

38. The purposeful bringing about of change is called
    1. resistance to change.
    2. accidental change.
    3. planned change.
    4. unplanned change.

39. The building of freeways in the United States is an example of
    1. resistance to change.
    2. accidental change.
    3. planned change.
    4. unplanned change.

40. The government of Mexico is providing money and training teachers so that every boy and girl in the country can receive an education. This is
    1. resistance to change.
    2. an accidental change.
    3. an unplanned change.
    4. a planned change.

41. The history of a culture that is transmitted is called
    1. universals.
    2. variations.
    3. heritage.
    4. technology.

42. The heritage of the culture of Mexico is largely a result of acculturation between the
    1. French and the Indians.
    2. Spanish and the French.
    3. Spanish and the Indians.
    4. English and the Indians.

43. The main language spoken in Mexico today is
    1. Spanish.
    2. English.
    3. Indian.
    4. Mexican.

44. The language of Mexico is
    1. hereditary.
    2. resisted.
    3. staying the same.
    4. changing.

45. In the southwestern part of the United States, over 6 million people speak
    1. Spanish.
    2. Indian.
    3. French.
    4. Russian.

Anthropology Curriculum Project
Cultural Change in Mexico and the United States
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ANTHROPOLOGY ACHIEVEMENT TEST 2

(Main Study)

SAMPLES:

A. Mexico is a
   1. city.
   2. country.
   3. state.
   4. river.

B. Your anthropology book is about
   1. Canada and Russia.
   2. France and Norway.
   3. Japan and China.
   4. Mexico and the United States.

Mark your answers on the separate answer sheet by completely filling in the box for each answer that you think is correct.

1. The way of life of a group of people is called
   1. culture.
   2. language.
   3. universals.
   4. technology.

2. During the Colonial Period, Mexican officials (other than at the town level) were
   1. elected.
   2. appointed.
   3. priests.
   4. creoles.

3. Cultural variations are differences in
   1. universals.
   2. traits.
   3. enculturation.
   4. acculturation.

4. Acculturation between the Spanish and the Indians is an important part of the heritage of
   1. Mexico.
   2. the United States.
   3. England.
   4. Spain.

5. The heritages of Mexico and the United States are
   1. the same.
   2. different.
   3. planned changes.
   4. mainly Catholic.

6. The language spoken by most people in Mexico today is
   1. English.
   2. Spanish.
   3. Indian.
   4. Mexican.

7. In contrast to Mexico, people in the United States during the Colonial Period became accustomed to
   1. appointed assemblies for making laws.
   2. elected assemblies for making laws.
   3. all government officials being elected.
   4. all government officials being native born Englishmen.

8. In Mexico fewer people are speaking Indian and more people are speaking
   1. Spanish.
   2. Mexican.
   3. French.
   4. English.

9. Cultural needs found in cultures throughout the world are called
   1. universals.
   2. variations.
   3. acculturation.
   4. biology.

10. The way people eat, dress, and speak in Mexico is largely determined by their
    1. universals.
    2. culture.
    3. biology.
    4. heredity.

11. The tradition of elected government officials in the United States diffused from
    1. England.
    2. Spain.
    3. Mexico.
    4. France.

12. One culture may adopt traits of another culture through the process of
    1. discovery.
    2. diffusion.
    3. cultural lag.
    4. resistance to change.

13. Rice and fish are important foods to the Japanese because of their
    1. universals.
    2. heredity.
    3. culture.
    4. biology.

14. Changes that come from within a culture are caused by
    1. diffusion and acculturation.
    2. discovery and invention.
    3. cultural lag.
    4. resistance to change.

15. In New Spain the chief executive was the viceroy who was appointed by the king. In independent Mexico the chief executive officer has been
    1. born in Spain.
    2. the viceroy.
    3. elected by the people.
    4. appointed by high officials.

16. Clothing, tools, and houses are examples of
    1. language.
    2. material traits.
    3. non-material traits.
    4. heredity.

17. People in the United States leave their shoes on when they go into their house while people in Japan take off their shoes to go in their house. This is a
    1. cultural universal.
    2. trait variation.
    3. material trait.
    4. biological need.

18. Change that is brought about deliberately is called
    1. resistance to change.
    2. accidental change.
    3. planned change.
    4. unplanned change.

19. During the Colonial Period the United States was administered by
    1. one governor who was over all of the colonies.
    2. a separate governor for each colony.
    3. a single agency in London.
    4. the President and Congress.

20. The culture of Mexico changed partly because silver was
    1. discovered.
    2. invented.
    3. diffused.
    4. acculturated.

21. Many farmers in the United States are using tractors instead of plows pulled by mules. We can say that these farmers are
    1. traditional.
    2. modernizing.
    3. universal.
    4. hereditary.

22. The government of the United States has been
    1. controlled by the military.
    2. overthrown many times.
    3. stable.
    4. unstable.

23. Doctors recommend that people get shots so that they won't get sick. Some people believe that shots won't help because evil spirits cause people to get sick. This is an example of
    1. modernization.
    2. cultural stability.
    3. acceleration of change.
    4. cultural lag.

24. Cultures that are adopting new ways of doing things in place of old ways are
    1. traditional.
    2. modernizing.
    3. stabilizing.
    4. hereditary.

25. The Mexican Constitution of 1917
    1. helped the Roman Catholic Church get land.
    2. helped the rich keep their land.
    3. helped Spain control Mexico.
    4. helped the poor get land.

26. The culture of South Africa changed partly because diamonds were
    1. discovered.
    2. invented.
    3. diffused.
    4. acculturated.

27. In some Indian villages in Mexico people speak the same language, dress in the same style clothes, and earn their living the same way that their fathers and grandfathers did. This is an example of
    1. acceleration of change.
    2. cultural stability.
    3. cultural instability.
    4. acculturation.

28. Enculturation is the process of learning
    1. one's own culture.
    2. another culture.
    3. hereditary characteristics.
    4. biological needs.

29. Individual items and behaviors of a culture are
    1. traits.
    2. universals.
    3. technology.
    4. hereditary.

30. Government ownership, operation and control of many industries and services
    1. was part of the culture of the Aztecs.
    2. was part of the culture of the English during the Colonial Period.
    3. is part of the culture of Mexico today.
    4. is part of the culture of the United States today.

31. Within the next few years the United States may change from the decimal number system to the metric system. This is
    1. a planned change.
    2. an unplanned change.
    3. resistance to change.
    4. an accidental change.

32. Since about 1930 the government of Mexico has been
    1. controlled by the military.
    2. overthrown many times.
    3. stable.
    4. unstable.

33. The building of factories in the United States without developing adequate means of preventing water pollution has resulted in
    1. trait variations.
    2. universals.
    3. cultural lag.
    4. cultural stability.

34. The United States has two major political parties. Mexico has
    1. one major political party.
    2. two major political parties.
    3. more than two major political parties.
    4. no major political parties.

35. Busses have replaced horses as a means of transportation in Mexico. Mexico is
    1. traditional.
    2. modernizing.
    3. universal.
    4. stabilizing.

36. Hundreds of years ago most Mexicans spoke Indian languages. Today most Mexicans speak Spanish. This is an example of
    1. cultural stability.
    2. cultural change.
    3. cultural universals.
    4. cultural lag.

37. Values, beliefs, and behaviors are part of the
    1. material culture.
    2. non-material culture.
    3. biological needs.
    4. hereditary characteristics.

38. In the past most Africans lived in small villages and very few lived in large cities. Today many more Africans live in large cities. This is referred to as
    1. cultural stability.
    2. cultural change.
    3. cultural lag.
    4. cultural universals.

39. Over a long period of time the Spanish and Indian cultures of Mexico were in close contact. The process by which Indians got Spanish traits is known as
    1. cultural stability.
    2. resistance to change.
    3. diffusion.
    4. acculturation.

40. Man's special way of learning his culture is through
    1. biology.
    2. universals.
    3. hereditary.
    4. language.

APPENDIX C

. Tables of Specifications for
Anthropology Achievement Tests
One and Two

TABLE 29

Table of Specifications for Anthropology Achievement Test Number One
Grade Three

Question	Concept	Specifications: Definition	Specifications: Example	Specifications: Application	Percentage getting item correct. Based on sample of three randomly selected classes.
1	culture	x			71
2	traits	x			57
3	technology	x			54
4	cultural universals	x			42
5	material traits	x			43
6	trait variations		x		50
7	enculturation			x	33
8	language	x			68
9	non-material trait			x	32
10	cultural change	x			27
11	cultural universal			x	32
12	cultural change	x			59
13	discovery			x	72
14	invention			x	74
15	diffusion			x	48
16	innovation	x			49
17	acculturation			x	37
18	acculturation	x			55

TABLE 29

Table of Specifications for Anthropology Achievement Test Number One (Cont'd)

Question	Concept	Specifications: Definition	Specifications: Example	Specifications: Application	Percentage getting item correct. Based on sample of three randomly selected classes.
19	diffusion	x			37
20	discovery and invention	x			27
21	diffusion and acculturation	x			37
22	enculturation		x		95
23	technology			x	55
24	material trait			x	50
25	culture (language)	x			68
26	enculturation			x	45
27	material trait			x	57
28	cultural change	x			49
29	cultural change			x	71
30	cultural change			x	33
	Number of items	15	2	13	
	Percent of items	50%	7%	43%	

TABLE 30

Table of Specifications for Anthropology Achievement Test Number Two
Grade Three

Question	Concept	Specifications: Definition	Example	Application	Percentage getting item correct. Based on data from the total treatment population.
1	urban areas	x			65
2	trait variations		x		49
3	cultural change		x		45
4	exporting		x		51
5	modernization		x		71
6	language	x			71
7	modernization	x			60
8	selective diffusion		x		63
9	modernization		x		60
10	culture	x			74
11	importing	x			47
12	cultural change	x			36
13	diffusion			x	36
14	technology			x	73
15	enculturation			x	47
16	industrialization			x	58
17	industrialization (pollution)		x		89
18	discovery			x	75

TABLE 30

Table of Specifications for Anthropology Achievement Test Number Two (Cont'd)

Question	Concept	Specifications: Definition	Example	Application	Percentage getting item correct. Based on data from the total treatment population.
19	urbanization		x		39
20	cultural change	x			48
21	culture (language)	x			70
22	material trait			x	54
23	population	x			61
24	diffusion and acculturation	x			40
25	manufacturing		x		65
26	invention and discovery	x			28
27	technology		x		73
28	urbanization	x			53
29	invention			x	59
30	industrialization		x		59
	Number of items	12	10	8	
	Percent of items	40%	33%	27%	

TABLE 31

Table of Specifications

Anthropology Test Number One
Grade Six

Question	Specifications				
	Concept	Definition	Example	Application	Percentage getting item correct. Based on selected classes.
1	culture	x			76
2	culture		x		28
3	culture			x	38
4	culture (language)	x			89
5	language		x		53
6	language		x		67
7	enculturation	x			58
8	enculturation		x		18
9	enculturation			x	33
10	cultural universal	x			31
11	cultural universal			x	32
12	trait variations	x			39
13	trait variations		x		11
14	trait variations			x	38
15	cultural traits	x			47
16	cultural traits			x	39
17	cultural traits			x	13
18	material traits	x			63

TABLE 31

Table of Specifications

Anthropology Test Number One

Question	Specifications				
	Concept	Definition	Example	Application	Percentage getting item correct. Based on selected classes.
19	material traits			x	57
20	non-material traits	x			61
21	non-material traits			x	22
22	cultural change	x			69
23	cultural change			x	22
24	cultural change			x	53
25	modernization	x			83
26	modernization			x	65
27	modernization			x	58
28	discovery	x			71
29	discovery		x		75
30	discovery			x	65
31	diffusion & acculturation	x			47
32	acculturation		x		54
33	acculturation			x	19
34	cultural stability	x			26
35	cultural stability		x		24
36	cultural lag	x			47

TABLE 31

Table of Specifications

Anthropology Test Number One

Question	Concept	Specifications: Definition	Example	Application	Percentage getting item correct. Based on selected classes.
37	cultural lag			x	28
38	planned change	x			60
39	planned change		x		53
40	planned change			x	53
41	cultural heritage	x			44
42	cultural heritage		x		50
43	language		x		71
44	cultural change		x		35
45	language		x		71
	Number of items	16	13	16	
	Percent of items (rounded to nearest whole number)	36	29	36	

TABLE 32

Table of Specifications

Anthropology Test Number Two
Grade Six

Question	Specifications				Percentage getting item correct.
	Concept	Definition	Example	Application	
1	culture	x			88
2	political institutions		x		51
3	trait variations	x			55
4	cultural heritage		x		72
5	cultural heritage		x		75
6	language		x		81
7	political institutions		x		31
8	cultural change (language)		x		75
9	cultural universals	x			50
10	culture		x		64
11	diffusion of political institutions		x		42
12	diffusion	x			43
13	culture			x	60
14	discovery & invention	x			40
15	political institutions		x		41
16	material traits			x	81
17	trait variations			x	38

TABLE 32

Table of Specifications

Anthropology Test Number Two

Question	Specifications				Percentage getting item correct.
	Concept	Definition	Example	Application	
18	planned change	x			59
19	political institutions		x		43
20	invention			x	81
21	modernization			x	85
22	political institutions		x		59
23	cultural lag			x	49
24	modernization	x			69
25	political institutions		x		62
26	discovery			x	78
27	cultural stability			x	45
28	enculturation	x			57
29	cultural traits	x			53
30	political institutions		x		27
31	planned change			x	68
32	political institutions		x		34
33	cultural lag		x		40
34	political institutions		x		44
35	modernization			x	74

TABLE 32

Table of Specifications

Anthropology Test Number Two

Question	Concept	Specifications: Definition	Example	Application	Percentage getting item correct.
36	cultural change		x		80
37	non-material traits	x			57
38	cultural change			x	62
39	acculturation		x		25
40	culture	x			73
	Number of items	11	18	11	
	Percent of items (rounded to nearest whole number)	28	45	28	

APPENDIX D

. Summary of Data
Grades Three and Six

TABLE 33

Word Knowledge: Reading

Summary of Data
Grade Three

Pre-Organizer		Post-Organizer		No Organizer	
Class	Raw Score Mean*	Class	Raw Score Mean*	Class	Raw Score Mean*
1	18.80	7	15.76	14	19.35
2	24.32	8	23.40	15	24.17
3	17.41	9	22.03	16	21.54
4	24.24	10	17.90	17	16.72
5	25.67	11	14.16	18	16.52
6	17.45	12	23.10	19	10.54
		13	14.36	20	14.17
ΣX_1	= 127.89	ΣX_2	= 130.71	ΣX_3	= 123.01
ΣX_1^2	= 2799.0395	ΣX_2^2	= 2541.99	ΣX_3^2	= 2286.93
$(\Sigma X_1)^2$	= 16355.85	$(\Sigma X_2)^2$	= 17085.10	$(\Sigma X_3)^2$	= 15131.46

*There were 36 items on the Word Knowledge Reading Test.

TABLE 34

Anthropology Achievement Test Number 1

Summary of Data
Grade Three

Pre-Organizer		Post-Organizer		No Organizer	
Class	Raw Score Mean*	Class	Raw Score Mean*	Class	Raw Score Mean*
1	12.33	7	12.81	14	15.46
2	16.11	8	17.19	15	18.52
3	14.87	9	17.29	16	17.42
4	17.45	10	17.41	17	17.14
5	15.45	11	15.90	18	14.94
6	15.61	12	16.07	19	10.71
		13	10.65	20	13.12

ΣX_1	= 91.82	ΣX_2	= 107.32	ΣX_3	= 107.31
ΣX_1^2	= 1419.56	ΣX_2^2	= 1686.12	ΣX_3^2	= 1689.28
$(\Sigma X_1)^2$	= 8430.91	$(\Sigma X_2)^2$	= 11515.44	$(\Sigma X_3)^2$	= 11515.44

*There were 30 items on Anthropology Achievement Test Number 1.

TABLE 35

Anthropology Achievement Test Number 2

Summary of Data
Grade Three

Pre-Organizer		Post-Organizer		No Organizer	
Class	Raw Score Mean*	Class	Raw Score Mean*	Class	Raw Score Mean*
1	13.81	7	13.93	14	16.62
2	20.44	8	20.37	15	22.16
3	17.15	9	20.28	16	20.57
4	18.97	10	17.88	17	19.74
5	20.36	11	13.57	18	15.90
6	17.81	12	13.96	19	11.68
		13	13.32	20	14.07

ΣX_1	= 108.54	ΣX_2	= 113.31	ΣX_3	= 120.74
ΣX_1^2	= 1994.24	ΣX_2^2	= 1896.40	ΣX_3^2	= 2167.28
$(\Sigma X_1)^2$	= 11780.93	$(\Sigma X_2)^2$	= 14578.15	$(\Sigma X_3)^2$	= 14578.15

*There were 30 items on Anthropology Achievement Test Number 2.

TABLE 36

Reading Vocabulary Class Means
Grade Six

Pre-organizer		Post-organizer		No-organizer	
Class	Raw Score Mean*	Class	Raw Score Mean*	Class	Raw Score Mean*
1	25.03	7	35.03	13	32.75
2	37.20	8	38.52	14	28.19
3	31.33	9	26.07	15	41.07
4	41.00	10	37.40		
5	34.95	11	44.41		
6	35.55	12	36.22		

*There were 50 items on the Reading Vocabulary Test.

TABLE 37

Anthropology Achievement Test Number 1
Grade Six

Pre-organizer		Post-organizer		No-organizer	
Class	Raw Score Mean*	Class	Raw Score Mean*	Class	Raw Score Mean*
1	22.85	7	20.36	13	19.28
2	25.92	8	30.86	14	18.33
3	20.08	9	19.42	15	24.39
4	27.46	10	22.88		
5	21.92	11	33.36		
6	22.68	12	28.08		

*There were 45 items on Anthropology Achievement Test Number 1.

TABLE 38

Anthropology Achievement Test Number 2
Grade Six

Pre-organizer		Post-organizer		No-organizer	
Class	Raw Score Mean*	Class	Raw Score Mean*	Class	Raw Score Mean*
1	26.42	7	21.81	13	19.43
2	22.38	8	24.73	14	17.95
3	20.24	9	22.48	15	24.80
4	24.57	10	22.63		
5	20.08	11	31.00		
6	22.58	12	25.15		

*There were 40 items on Anthropology Achievement Test Number 2.